REMARKS

In lieu of paying the issue fee in connection with the present application, the Applicant has decided to continue prosecution of the claims. In this amendment, allowed independent claim 17 has been rewritten as a dependent claim, and new claims 18 - 30 have been added. Reconsideration of the rejections of the claims is respectfully requested in view of the above amendments and the following remarks.

On page 2 of the Official Action of February 7, 2005, all of claims 1 - 17 which were then pending were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as unpatentable over claims 12 - 31 of copending Patent Application No. 10/666,129.

This provisional rejection is respectfully traversed. Claims 17 - 30 of the present application each include at least one component (Co, for example) which is not only absent from any of the claims of 10/666,129 but is in fact excluded from those claims. The claims of 10/666,129 recite a composition "consisting" of certain elements, and Co is not among any of those elements of which the composition can "consist". As such, there is no similarity between the claims of the two applications. Concerning this rejection, page 6 of the Official Action of February 7, 2005 states that "the instant claimed solder composition includes the solder composition of co-pending application (10/666,129)". By this statement, it is assumed that the Official Action means that all the elements claimed in the claims of application 10/666,129 are present in the claims of the present application. However, that fact by itself has no legal significance. A claim which recites elements ABC is not automatically obvious from a claim which recites elements ABCD. If this were true, then every claim which recited a wheel as a part of a combination would be obvious from the first patent in history to recite a wheel. For obviousness to be established, it is necessary to show some motivation for a person skilled in the art to modify the compositions claimed in 10/666,129 to supply the missing element(s), but the Official Action has failed to show any such motivation or indeed any teaching that could be combined with the claims of 10/666,129 to supply the element(s) missing from the claims of 10/666,129 to result in the compositions of the claims of the present application. Accordingly, the provisional rejection fails to meet the requirements for setting forth a *prima facie* case of obviousness and thus is improper. Withdrawal of the provisional rejection is respectfully requested.

On page 3 of the Official Action of February 7, 2005, claims 1 - 6, 8, and 11 - 13 were rejected under 35 USC 103(a) as unpatentable over JP 55-20403. This rejection is respectfully traversed.

Claims 1 - 6, 8, and 11 - 13 have been cancelled and replaced by independent claim 18 and claims 17 and 19 - 30 which depend from it. Claim 18 describes a lead-free solder consisting essentially of 1.5 - 8 mass % of Cu, 0.01 - 2 mass % of Co, 0 - 1 mass % of Ni, and a remainder of Sn. Claim 18 is of intermediate scope between previously presented claims 1 and 12. JP 55-20403 does not disclose or suggest such a composition.

JP 55-20403 discloses a brazing material for use in connecting external parts of a watch. The brazing material comprises 10 - 85% Au, 15 - 90% Sn, and it may further include one or more of Ni, Ag, P, Co, Ca, Mn, Rd, Pt, Ph, Sb, Se, and Te. The requirement of JP 55-20403 for an Au content of at least 10% prevents any of the alloys of that reference from rendering obvious a solder consisting essentially of 1.5 - 8 mass % of Cu, 0.01 - 2 mass % of Co, 0 - 1 mass % of Ni, and a remainder of Sn as set forth in claim 18, since the high content of Au required by JP 55-20403 is excluded from such a claim by the use of the expression "consisting essentially of".

Accompanying this response is a declaration under 37 CFR 1.132 prepared by Tsukasa Ohnishi, who is the inventor of the present application. This declaration addresses the basic and novel characteristics of an alloy consisting essentially of 1.5 - 8 mass % of Cu, 0.01 - 2 mass % of Co, 0.01 - 1 mass % of Ni, and a remainder of Sn (which is an alloy as claimed in claim 19), but as will be discussed below, these characteristics also apply to the alloy of claim 18 which differs from the alloy discussed in the declaration only in that it has a Ni content of 0 - 1 mass % instead of 0.01 - 1 mass %.

As set forth in that declaration, among the basic and novel characteristics of an alloy consisting essentially of 1.5 - 8 mass % of Cu, 0.01 - 2 mass % of Co, 0.01 - 1 mass % of Ni, and a remainder of Sn are a low tendency to cause copper leaching and a low material cost that is comparable to that of conventional alloys used for coating of coil ends. Paragraphs 7 and 8 of the declaration show that conventional lead-free solders used for dip coating typically have a unit cost in the range of approximately $5 - $15. As shown by paragraph 9 of the declaration, the most expensive alloy containing only 1.5 - 8 mass % of Cu, 0.01 - 2 mass % of Co, 0.01 - 1 mass % of Ni, and a remainder of Sn (an alloy on which claims 17 - 19 read) is approximately $8.68/kg.

In contrast, as shown by paragraph 14 of the declaration, the minimum cost of any alloy covered by JP 55-20403 is $1379.67. As described in paragraph 16 of the declaration, such an alloy is prohibitively expensive and totally unsuitable for use in coating copper wires. As such, an Au content of at least 10% as required by JP 55-20403 would materially affect the basic and novel characteristics of an alloy consisting essentially of 1.5 - 8 mass % of Cu, 0.01 - 2 mass % of Co, 0.01 - 1 mass % of Ni, and a remainder of Sn because the cost of the resulting alloy would be nearly 100 times the cost of conventional alloys for the same purpose.

The same applies to an alloy as claimed in claim 18 consisting essentially of 1.5 - 8 mass % of Cu, 0.01 - 2 mass % of Co, 0 - 1 mass % of Ni, and a remainder of Sn. As shown by Examples 1 - 3 in Table 1 of the present application, an alloy containing only 1.5 - 8 mass % of Cu, 0.01 - 2 mass % of Co, 0 - 1 mass % of Ni, and a remainder of Sn has a significantly lower copper leaching speed than conventional alloys whether it contains Ni (Examples 2 and 3) or is without Ni (Example 1). In addition, an alloy containing only 1.5 - 8 mass % of Cu, 0.01 - 2 mass % of Co, 0 - 1 mass % of Ni, and a remainder of Sn has basically the same unit cost as an alloy containing only 1.5 - 8 mass % of Cu, 0.01 - 2 mass % of Co, 0.01 - 1 mass % of Ni, and a remainder of Sn. For both alloys, the maximum unit cost is approximately $8.68/kg.

Thus, since the addition of at least 10% of Au would materially affect the basic and novel characteristics of an alloy containing only 1.5 - 8 mass % of Cu, 0.01 - 2 mass % of Co, 0 - 1 mass % of Ni, and a remainder of Sn, this amount of Au (the amount required by JP 55-20403) is excluded from a solder as set forth in claim 18 consisting essentially of 1.5 - 8 mass % of Cu, 0.01 - 2 mass % of Co, 0.01 - 1 mass % of Ni, and a remainder of Sn. As such, JP 55-20403 does not suggest a solder as set forth in claim 18 and cannot render claim 18 or any of the claims which depend from it obvious. Claim 18 and claims 17 and 19 - 30 which depend from claim 18 are therefore allowable.

Aside from the fact that the language "consisting essentially of" in claim 18 excludes the high Au content required by JP 55-20403, as set forth previously, JP 55-20403 does not suggest to a person skilled in the art the specific composition set forth in claim 18 on account of the vast number of compositions which its disclosure covers.

As stated above, the brazing material disclosed in JP 55-20403 comprises 10 - 85% Au, 15 - 90% Sn, and it may further include one or more of Ni, Ag, P, Co, Ca, Mn, Rd, Pt, Ph, Sb, Se, and Te. This generic description covers 2047 unique combinations of these alloying elements, and yet the only specific compositions which the reference discloses are an Au-Sn binary alloy, an Au-Sn-Ni alloy, and an Au-Sn-Mn alloy. There is nothing in this reference to guide a person skilled in the art to select a Sn-Cu-Co-(Ni) composition as set forth in claim 18 of the present application from the 2044 other compositions encompassed by its generic disclosure.

The situation of claim 18 of the present application with respect to JP 55-20403 is thus completely analogous to the situation in In re Baird, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994), in which the PTO had rejected a claim to a specific chemical composition based on a reference which disclosed a generic formula. While the formula encompassed the claimed composition, it also encompassed millions of other compositions, and the reference failed to suggest the specific claimed composition. The Federal Circuit reversed the rejection on the basis that the fact that a claimed substance may be encompassed by a disclosed generic formula does not by itself render that substance obvious. That decision makes clear that it is inadequate for a reference to merely disclose a generic formulation describing a vast number of choice which happen to include a claimed composition. Rather, there must be teachings in the reference that suggest selecting the specific composition set forth in a claim.

Therefore, in order for the alloy recited in claim 18 to be obvious, there must be some specific suggestion in JP 55-20403 to select this combination of alloying elements from the enormous number of possible combinations covered by the generic disclosure of the reference. Since this reference contains no such suggestion, JP 55-20403 cannot render claim 18 or any of the claims which depend from it obvious.

Claim 21 further patentably distinguishes the present invention from JP 55-20403. Claim 21 describes a composition further including a maximum of 2.0 mass % of Ag.
The Official Action of February 7, 2005 acknowledges that JP 55-20403 does not teach a composition containing Ag in the claimed amount. Namely, the content of Ag is specified in JP 55-20403 as being a minimum of 3%. The Official Action states that a *prima facie* case of obviousness exists where the claimed range and prior art do not overlap but are close enough that one of ordinary skill in the art would have expected them to have the same properties. The error in this argument is its unsupported assertion that a person skilled in the art would have expected an alloy having an Ag content of 2% but otherwise the same as that of JP 55-20403 to have the same properties as one having an Ag content of 3%. The only way that a person skilled in the art could draw such a conclusion would be if he were to completely ignore the reference which the rejection relies upon, since page 10, upper right column - lower left column of the Japanese text of JP 55-20403 states that "With less than or equal to 0.1% Ni, 0.1% Cu, 3% Ag, ... the effect on increasing strength is small...". This is a clear teaching that an alloy with a content

of less than 3% does not have the same properties as one having a content of greater than 3%. To set forth a *prima facie* case of obviousness, the Official Action must show some specific motivation in the references to modify them, not simply rely on a per se rule while ignoring the teachings of the reference that modifying the reference does in fact produce a change in properties. Since the reference provides no motivation to modify its composition but on the contrary teaches away from a composition containing 3% or less Ag, claim 21 cannot be obvious from this reference.

Page 5 of the Official Action of February 7, 2005 also cited JP 11-216591. Claims 17 - 30 of the present application are also allowable over this reference. As stated above, independent claim 18 describes a solder consisting essentially of 1.5 - 8 mass % of Cu, 0.01 - 2 mass % of Co, 0 - 1 mass % of Ni, and a remainder of Sn. JP 11-216591 discloses a soldered product which contains at least one of Co, Fe, Mn, Cr, and Pd, at least one of Ag, Cu, and Sb, and a remainder of Sn. The abstract of that reference states that the Cu content of the alloy can be 0.5 - 2 mass %. While this reference does disclose an example of an alloy with a Cu content of 2% (Example 32 in Table 1, which is a Sn-Pd-Cu alloy), in all other examples, the maximum content of Cu is 0.7. The one example in this reference of an alloy containing both Cu and Co contains 0.5% Co and only 0.7% Cu. There is no realization in this reference of the beneficial effects which can be obtained in an alloy containing both Co and Cu in which the Cu content is at least 1.5%, as set forth in claim 18, and there is nothing in this reference that would lead a person skilled in the art to pick a value of at least 1.5% for the Cu content from the broad range of 0.5 - 2 mass % which it discloses. The Applicant is in the process of obtaining experimental data showing the unexpected effects of a Cu content of 1.5 - 8 mass % in an alloy according to the present invention consisting essentially of Sn, Co, Cu, and (Ni) as claimed in claim 18. It is expected that this data will be available by the end of September, 2005, at which time the data will be presented in the form of a formal declaration. This data will demonstrate that the compositions of claim 18 and of dependent claims 17 and 19 - 30 are not obvious from JP 11-216591.

Claims 17, 19, 27, 29, and 30 further patentably distinguish the present invention from JP 11-216591 by including Ni as a constituent. There is no teaching or suggestion in JP 11-216591 concerning the use of Ni in any of its alloys.

On page 4 of the Official Action of February 7, 2005, claims 7, 9 - 10, and 14 - 15 were rejected under 35 USC 103(a) as unpatentable over JP 55-20403 in view of the description on page 3 of the present application of certain conventional lead-free solders which are said to be capable of preventing copper leaching. This rejection is respectfully traversed.

Claims 7, 9, and 10 generally correspond to new claims 22 - 24, which describe a coil with a precoated end (claim 22), a soldering method using the coil of claim 22 (claim 23), and a method of treating a copper wire (claim 24). Each of these claims depends from claim 18 and involves the use of the solder set forth in that claim.

As explained above, JP 55-20403 does not disclose or suggest an alloy as set forth in claim 18, so it cannot render obvious a method or product using the solder described by that claim. Claims 22 - 24 are therefore allowable.

Claims 22 - 24 further patentably distinguish the present invention from the cited references because there is nothing in the references that would suggest using such the alloy of JP 55-20403 to coat an end of a wire.

The brazing material disclosed in JP 55-20403 is described solely for use in joining external parts of a watch to each other, such as to join a watch band to a watch case, or to join a pipe for receiving a winding stem to the watch case. A person skilled in the art would find no teachings in JP 55-20403 to suggest using the materials generically encompassed by this reference to coat an end of a wire.

In particular, every alloy disclosed in JP 55-20403 is an Au-based alloy containing a minimum of 10% and up to 85% of Au. In contrast, the only one of the conventional alloys mentioned on page 3 of the present application which contains any Au is the alloy disclosed in JP 2001-121286, which is an Sn-Cu base alloy which may additionally contain Ag, Ni, and very minor amounts of Ge and/or Au. As can be seen from Table 3 of that reference, none of the alloys disclosed therein contains more than 0.010% of

Au, which is a mere 1/1000th of the minimum level of Au required of the alloys disclosed in JP 55-20403. No person skilled in the art would see any resemblance between the alloys disclosed in JP 55-20403 and the conventional alloys disclosed on page 3 of the present application and thus could not find any motivation from the present application to employ any of the alloys disclosed in JP 55-20403 to coat an end of a wire.

This fact is further supported by paragraph 17 of the attached declaration, which explains why a person skilled in the art would never consider using any of the alloys described in JP 55-20403 to coat a wire because of their prohibitive cost and resulting impracticality.

Claim 17, which was previously allowed, has been rewritten as a dependent claim but remains unchanged in scope and so remains allowable.

In light of the foregoing remarks, it is believed that the present application is in condition for allowance. Favorable consideration is respectfully requested.

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